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ABSTRACT

Task Analysis is both a testing device that assesses the developmental status and progress of children and an instructional approach that takes into account the sequential development of skillfulness in young children. In assessing the motor developmental status of children task analysis is concerned with isolating and defining important environmental and task variables that influence motor skill performance. The aim is to provide a classification of component parts (general factors) that can and do account for some individual differences in skillful performance. The two identification techniques used are General Task Analysis (GTA) and Specific Task Analysis (STA). The GTA objective is to identify any and all factors specifically related to the task and the environment that can influence the movement behavior of children in a selected general motor category such as striking, throwing, kicking, catching, and running. The STA involves the selection of certain factors from the GTA that are viewed in combination over their levels of complexity. This provides a point of reference from which more refined movements can be systematically introduced, accomplished, and evaluated. (Tables and figures are given.) (JMF)

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New Directions in Assessment: Psychomotor Development

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New Directions in Assessment: Psychomotor Development

There exists in the area of motor evaluation a variety of tests which are useful in assessing children's motor developmental status from very early ages. Though these tests are extensive in scope they give limited attention to assessments in the motor domain. Most of the motor development items from these tests are observational in origin and subjective in report with no allowance made for progressions within a skill area. Likewise, there are no provisions made to place a child along a motor developmental continuum for a particular skill. Assessments of a broad age range is also not available, for most scales do not assess motor developmental status past six years of age. In our physical education settings we need more practically oriented tests which can be incorporated into the class environment, using a minimum of time, and using preferably, existent space, organizational structure and materials. The Task Analysis approach to this assessment situation is an attempt at a beginning.

Task Analysis is both a testing device which can assess the developmental status and progress of children and an instructional approach which takes into account the sequential development of skillfulness in young children. No emphasis is placed on the age-developmental maturity relationship for a particular skill because this sometimes produces an insensitive categorization of a child as being retarded or slow. The Task Analysis can be of practical use not only in the elementary grade

levels and middle school, but also in exceptional child settings. By using an assessment test which takes into account not only the evaluation of a child's status in a particular skill, but also an approach to sequencing skill learning at increasingly more complex levels, the management and construction of a program of activities can be channeled more effectively toward refinement of skillful movement.

The concept of Task Analysis is comprised of two identification techniques. The first is referred to as General Task Analysis (GTA), while the second is called Specific Task Analysis (STA) and is based upon the first. In a GTA the objective is to identify any and all factors specifically related to the task and the environment which can influence the movement behavior of children in a selected general motor category. General motor categories such as striking, throwing, kicking, catching, running and the like, are of concern here. After indetification of the factors which can influence a particular motor skill we may begin to see how a single factor or a combination of factors can cause a task to be more or less complex for the child to execute. As an example, a GTA for striking behaviors might involve an identification of such factors as:

1. the size of the object being struck,
2. the weight of the object being struck,
3. the speed of the object being struck,
4. the predictability of its trajectory,
5. the level at which the object is traveling,
6. the length of the implement used to strike,
7. the inclination of the surface area of the implement,
8. the size of implement's striking surface,
9. the force required to strike the object,
10. the accuracy of the strike,
11. the side to which the object is traveling with regard to the child,
12. the anticipatory locomotor spatial adjustment the child must make,

13. the speed of the child's movement prior to the strike, and
14. the direction the child must move prior to the strike.

Insert Table 1 about here

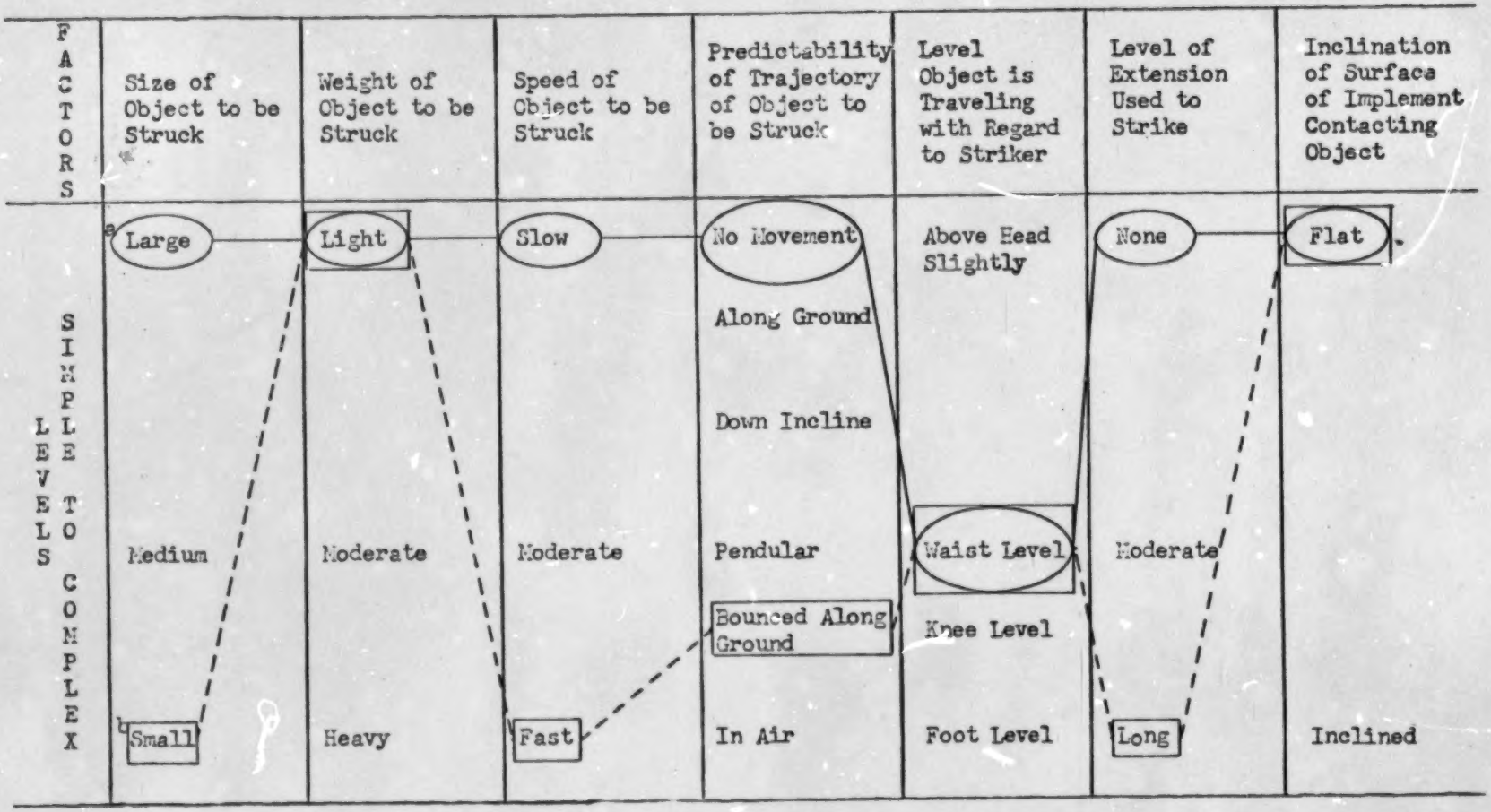
These are fourteen GTA factors; many more can be identified which can influence any striking behavior, regardless of the child who is performing or the specific nature of the task. The degree to which a task involves one or more of these factors is delineated by Levels, ranging from simple to complex (Table 1). The level within each factor will fluctuate depending upon the demands of the task being described. For instance, in the GTA example of striking behavior, the first factor identified as influencing the movement was "size of the object to be struck". The levels are broadly classified as large, medium, small, indicating that in this one factor, by decreasing the size of the object being struck we may contribute to the complexity of the task and perhaps its successful performance by the child.

After completing the identification of a level for each factor under consideration in the GTA, we have described what is called a Profile of a striking performance. By approaching the presentation of a motor task in this manner, through the identification of the components of the behavior at the desired level of complexity, insight into the demand being placed on the child is given consideration from the onset of the evaluation. For instance, such a Profile is noted on the GTA by identifying a majority of simple level descriptors under each factor (Table 1). It involves a child responding to a situation such as:

> striking a large, light-weight object, suspended from a string. The child would be standing stationary, using the flat surface of the favored hand to strike the object.

TABLE 1

GENERAL TASK ANALYSIS
A DEVELOPMENTAL SCHEMATIC REPRESENTATION OF FACTORS INFLUENCING STRIKING BEHAVIOR

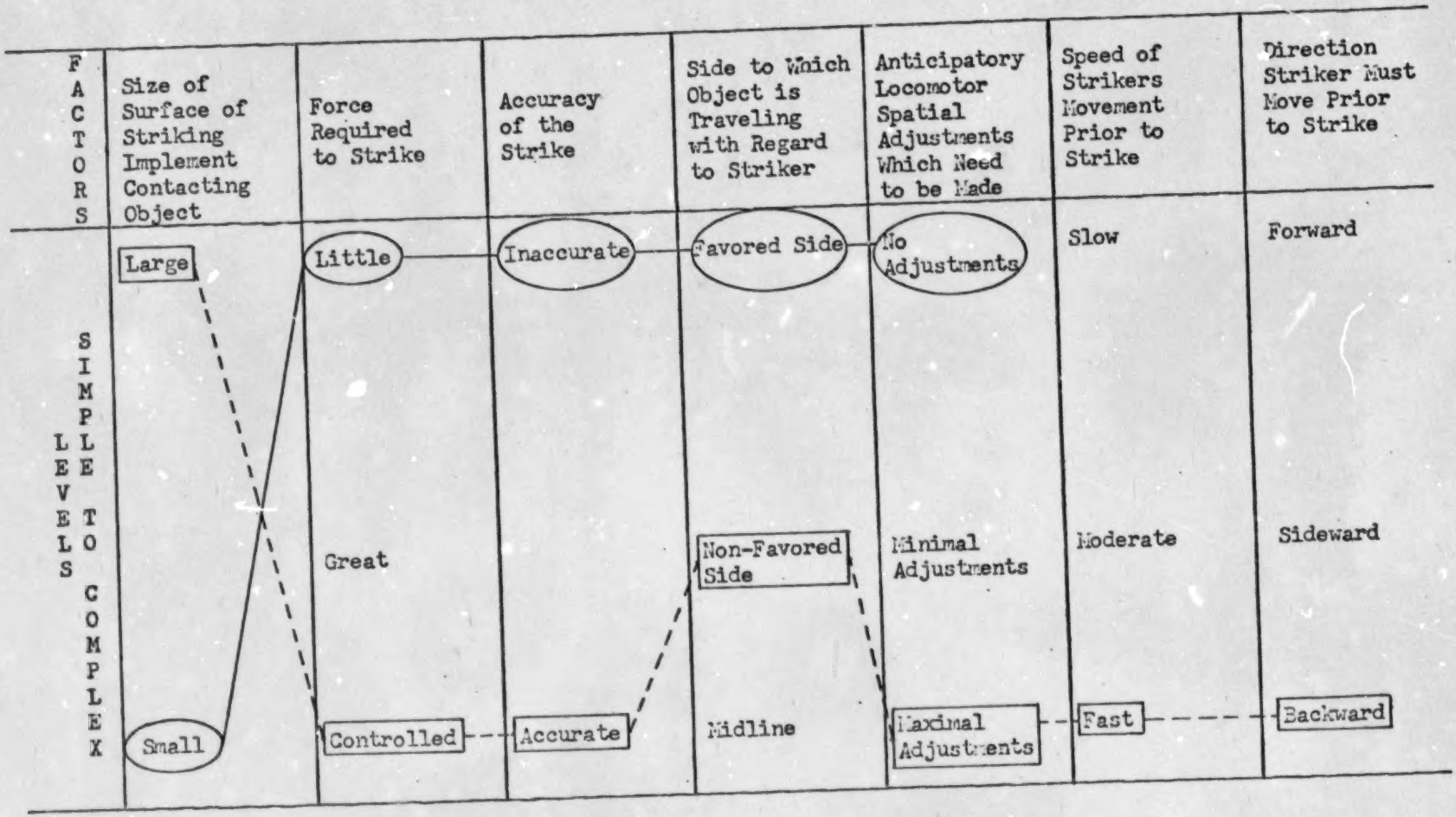


[a]Profile of a GTA for a simple striking task

[b]Profile of a GTA for a complex striking task

TABLE 1 (cont.)

GENERAL TASK ANALYSIS
A DEVELOPMENTAL SCHEMATIC REPRESENTATION OF FACTORS INFLUENCING STRIKING BEHAVIOR



This profile represents a relatively simple striking task particularly when it is compared to a complex striking task as in a tennis player's attempt to respond in movement and judgement in the placement of a return to a drive shot sent cross-court to the backhand side. Once one becomes familiar with factors that influence striking behavior one may begin to examine how these factors influence performance in specific striking tasks. This, then,is the second component of the Task Analysis procedure, the Specific Task Analysis.

The Specific Task Analysis (STA) involves the selection of certain factors from the GTA that we wish to view in combination over their levels of complexity. We want then to observe these factors in a progressive sequence, from simple to complex, that will in turn reflect a developmental continuum for the particular striking behavior. When an evaluation is made of a child's response to this specific situation, the information is more meaningful in terms of specific responses to the factors under consideration.

STA analyses are formed by inventing an activity that incorporates the factors chosen from the GTA and to be used in the evaluation. An example of a STA invented to elicit a specific striking behavior is in the one called "Keep Out" (Figure 1). In this game representation of the STA only three factors have been chosen from the GTA and examined. These are: size of the object to be struck, length of the striking implement, and predictability of the trajectory of the object being struck. The child's task is to strike approximately three of four balls out of a goal area measuring five yards by three yards. The child should be able to do this for; increasingly smaller sized balls, with implements that are increasingly longer in length, and with balls whose trajectories are

CLUSTER: GROSS MOTOR

MODULE: PROPULSION - RECEIPT OF OBJECT

TASK: STRIKING

ACTIVITY: "KEEP OUT"

CHILD'S TASK: To strike approximately 3 of 4 balls out of a goal area which is 5 yards by 3 yards.

The child should be able to do this for;

1. Increasingly smaller sized balls.
2. Implements that are increasingly longer in lwngth.
3. Balls whose trajectories are increasingly less predictable.

EQUIPMENT:

ping pong paddle
1½' dowel rod
plastic bat 3"x36"
12" beach ball
9" beach ball
4" wiffle ball
tennis ball

FACTORS INFLUENCING STUDENT PERFORMANCE

LEVELS (SIMPLE TO COMPLEX)	SIZE OF BALL	LENGTH OF STRIKING IMPLEMENT	PREDICTABILITY OF THE TRAJECTORY OF THE BALL
	S1 12" beach ball	L1 hand	P1 along ground (no bounce)
	S2 9" beach ball	L2 ping pong paddle	P2 bounced along ground
	S3 4" wiffle ball	L3 1½' dowel rod (wooden)	P3 aerial ball
	S4 tennis ball	L4 36" plastic bat (approx. 2-3" wide at top)	

FIGURE 1.--Example of a Specific Task Analysis for a striking task called "Keep Out".

increasingly less predictable. All three factors are expressed in the general terms of the levels contained in each. Each level within each factor can now be translated into specific items of equipment and task specifications. In factor one, size of the object includes balls varying in size from twelve inches to approximately two inches. Factor two, length of the implement, includes the hand, ping pong paddle, and a plastic bat. Factor three, predictability of trajectory, includes the object traveling along the ground (no bounce), bounced along the ground, and an aerial trajectory. As indicated earlier, levels within each factor progress from simple to complex, making the task and subsequent progressions developmentally more difficult for the child to master. As in the majority of the STA's the object is to make the evaluations, involving the environment, the task, the choice of equipment, representative of physical education related activities.

Profiles of performance for the STA are conceived of in much the same manner as in the case of the GTA. The only difference is that the level designations become more operationally defined in terms of a specific task-related situation. Varied profiles can be identified within the STA by changing the levels of each factor. Thus, the teacher or evaluator is at liberty to also test different children at different operationally defined levels of developmental complexity by selecting out certain profiles of evaluation for certain children.

STA can be used to place a child along a developmental continuum with regard to a specified STA profile. This is done through the use of a Grid Evaluation (Figure 2). This composite graph displays all levels of factors within the STA. The relation between the different levels of factors can be seen, together with the overall progression to the most

ASSESSMENT

	[a]P1				P2				P3			
	[b]L1	L2	L3	L4	L1	L2	L3	L4	L1	L2	L3	L4
[c]S1												
S2												
S3												
S4												

[a]P1 along ground with no bounce
P2 bounced along ground
P3 aerial ball

[b]L1 hand
L2 ping pong paddle
L3 1½' wooden dowel rod
L4 36" plastic bat

[c]S1 12" beach ball
S2 9" beach ball
S3 4" wiffle ball
S4 tennis ball

FIGURE 2.--Grid Evaluation for the Specific Task Analysis, "Keep Out".

complex levels of the STA, as selections of profiles are made farther to the right in the Grid Evaluation. When a child performs a specified profile correctly (according to the behavioral statement) the date of accomplishment can be recorded in the appropriate grid box. In this way the rate and direction of a child's progress can be ascertained. Factors which have provided the child with the greatest difficulty may be defined in terms of the STA and dealt with by the instructor in a more concise manner. If groups of children demonstrate they are having difficulty with a factor or certain factors in combination, that can also be dealt with.

It is also possible that these specific and general task analyses can serve as guidelines in the designing and sequencing of movement experiences for children by the instructor. It must be pointed out, however, that depending upon the grade level and certain mental and physical capabilities, the STA selection of items to operationally define levels of complexity will vary. The teacher may select out certain cells within the STA which she believes to be developmentally appropriate in assessing the motor status among the children being evaluated. The only prerequisite to this selection is that those cells which are chosen must be representative of the expected developmental ability of the particular maturational level the teacher perceives she's working with.

In conclusion, the Task Analysis approach to assessing the motor developmental status of children is concerned with isolating and defining important environmental and task variables which influence motor skill performance. The aim of this is to provide a classification of component parts (general factors) that can and do account for some individual differences in skillful performance. In other terms, Task Analysis

can not only be a viable way of thinking about sequencing movement experiences for young children in structured environmental settings, but also an attempt to focus on the progress a child is exhibiting developmentally in his/her motor skill performance. The thrust is not to categorize a particular stage or pattern a child manifests but rather to provide a point of reference from which more refined movements can be systematically introduced, accomplished, and evaluated.